1.1 Radio Astronomy

1.1.1 Maintenance and Calibration

- Checked DSS65 S-band phase cal tones. Phase instability noticed during Clock Sync support on DOY 109 was not reproducible (Maint DSS65 DOY 119). Problem to be further investigated.
- Tested new version of sidereal_apc TDN connection block to support Reference Frame Calibration (RFC) experiments with BWG antennas that gave problems on DOY 101. Several bugs have been found and reported (ATOT Devel DSS55 DOY 092, STA Dir DSS54 DOY 110, STA Dir DSS55 DOY 113).
- Development of a TDN connection block to perform ONOFF cycles with DSS54 antenna and command the SPB500 spectrometer (ATOT Devel DSS55 DOY 092, STA Dir DSS54 119). To be used for Q-band observations because EAC does not have interface with BWG antennas.
- Received and installed Q-band drive unit on DOY 107. Performed cool down process without problems.
- Q-band subreflector optimization and efficiency measurements (ATOT Devel DSS54 DOY 111). Found best attenuation settings for different frequencies and both polarizations to improve linearity (STA Dir DSS54 DOY 114).
- Continued the development and testing of several TDN connection blocks to support VLBI observations.

1.1.2 RA meetings and training courses

CGM attended the EVN Technical and Operations Group meeting held at Torun Center for Astronomy, Poland, April 17th. Robledo report can be found at http://www.mpifr-bonn.mpg.de/div/vlbicor/tog_chair/togreps09/. Minutes of the meeting will be published at http://www.mpifr-bonn.mpg.de/div/vlbicor/tog_chair/togmins/togmins.html.

Preparation for an IYA event at the Robledo de Chavela primary school on May 29th. CGM attended two meetings at the school and is responsible for training the teachers and coordinating the astronomers (professional and amateur) and their instrumentation for the outreach observation. PARTNeR will also participate with the secondary students.

1.1.3 Observations

1.1.3.1 Host Country Spectroscopy

During this month spectroscopy observations with DSS-63 antenna were carried out using the SPB500 spectrometer and the MarkIV data acquisition terminal. Following Host Country projects were performed using DSS-63 antenna:

- **D63-S01:** study of CCS molecule (22.334 GHz) extended emission in young low-mass proto-stars. The CCS molecule is abundant in molecular clouds during the first stages of star formation. We plan to make maps of its emission in several start-forming regions, to study their physical conditions and chemical processes in the cloud.

- **D63-S03:** Water maser monitoring in selected low-mass star-forming regions. The detection of the maser with DSS-63 will allow to request an exploratory time to the Very Large Array, and determine their position. The exact position of the water maser emission is needed to study the nature of the different young stellar objects in the region.

- **D63-S10:** search for chemical differences in different positions of a LBV nebula.

DOY	minutes scheduled	minutes used	Percent good data	Activity	comments
090	240	230	90	"GBRA H/C D63-S01"	OK
099	150	140	100	"GBRA H/C D63-S10"	OK
104	225	165	80	"GBRA H/C D63-S01/S03"	OK
110	230	200	0	"GBRA H/C D63-S10"	No detection, weather instability
118	210	100	0	"GBRA H/C D63-S10"	Conf problems?

1.1.3.2 Interferometry

MDSCC participated in 6 Very Long Baseline Interferometric (VLBI) observations (5705 min in total):

- RFC Clock Synchronization on DSS-65 (2 observations; 440 min): 100% data collected; performance of the system nominal, except for second observation that it was noticed a problem with S-band phase cal tones.
- RFC Catalog M&E S/X on DSS-65 (2 observations; 2785 min): 100% data collected; performance of the system nominal.
- RFC Catalog X/Ka on DSS-55 (1 observation; 1300 min): DSS-55 antenna had several problems with EL and AZ drives, 57 sources were lost (13% data lost, DR#M105307).
- IVS Space Geodesy Program on DSS-65 (1 observation; 1180 min): 100% data collected, performance of system nominal. Observation log including uvflag information and antabfs file sent to IVS server.